

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**DECLARATION OF ACCURACY OF TRANSLATION
IN LIEU OF SWORN TRANSLATION (37 C.F.R. § 1.68)**

The undersigned translator, Masao Mitsuyoshi, serving in a firm of Kyoritsu International (Tokyo Office) located in c/o Chanokiya Bldg., No. 3-1, Nihonbashi-Honcho 2-chome, Chuo-ku, Tokyo 103-0023, Japan, hereby certifies and declares that:

(1) I am fully conversant with both the Japanese language and the English language;

(2) I have translated the Japanese-language specification of the Japanese patent application, entitled "IMAGE PROCESSING APPARATUS AND DATA PROCESSING SYSTEM" filed on November 27, 2002 in the Japanese Patent Office under the Filing No. 2002-343724 (343724/2002), into English, the Japanese-language specification being filed as a certified priority document in the United States Patent and Trademark Office together with the United States patent application entitled "IMAGE PROCESSING APPARATUS AND DATA PROCESSING APPARATUS" and filed on October 30, 2003 under Serial No. 10/699,279. A copy of the English translation is attached hereto; and

(3) The attached English translation is, to the best of my knowledge, and belief, an accurate and literal translation from the Japanese language into the English language.

The undersigned, Masao Mitsuyoshi, hereby declares further that all statements herein of my own knowledge are true; and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the matter with which this translation is used.

On this *9th* day of *March*, 2007


Masao Mitsuyoshi

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[Inventor]
[Domicile or Residence] c/o KONICA CORPORATION
No. 2970, Ishikawa-cho, Hachioji-shi, Tokyo
[Name] Tatsuyoshi HAGA

[Inventor]
[Domicile or Residence] c/o KONICA CORPORATION
No. 2970, Ishikawa-cho, Hachioji-shi, Tokyo
[Name] Hiroshi SASADA

[Applicant]
[Identification Number] 000001270
[Name] KONICA COTPORATION

[Agent]
[Identification Number] 100090033
[Patent Attorney]
[Name] Hiroshi ARAFUNE

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[TITLE OF INVENTION] IMAGE PROCESSING APPARATUS AND DATA
PROCESSING SYSTEM

[SCOPE OF CLAIM FOR PATENT]

[CLAIM 1]

An image processing apparatus connected to a file server having a database for storing data of application information for the image processing apparatus and test data used in a communication test, which is characterized by comprising:

a data storage unit for storing communication parameters set up to acquire data of the application information from the file server;

a communication unit for transmitting request information for the test data to the file server by making use of the communication parameters, the transmission is executed in response to an execution instruction for the communication test;

a control unit for detecting a communication error generated within a period from the transmission of the request information to the reception of the test data; and

a display unit for displaying the detection result of the communication error.

[CLAIM 2]

The image processing apparatus set forth in claim 1, which is characterized in that the control unit can detect the communication error in a manner of a plurality of divided stages with in the period from the transmission of the request information to the reception of the test data.

[CLAIM 3]

The image processing apparatus set forth in claim 2, which is characterized in that:

the control unit can detect the communication parameters used in a communication stage at which the communication error is detected; and

the display unit can display a notification information showing a matter that the detected communication parameters are erroneously set up.

[CLAIM 4]

The image processing apparatus set forth in claim 1, which is characterized in that:

the control unit can calculate a communication speed from a data size of the test data received by the communication unit and a time required for the reception of the test data; and

the display unit can display the calculated communication speed.

[CLAIM 5]

The image processing apparatus set forth in claim 4, which is characterized in that:

the control unit can calculate an assumption time required on the occasion of receiving data of the application information from the file server on the basis of the calculated communication speed; and

the display unit can display the calculated assumption time.

[CLAIM 6]

A data processing system in which an image processing apparatus connected to a file server having a database for storing data of application information for the image processing apparatus and test data used in a communication test, which is characterized in that:

the image processing apparatus comprising:

a data storage unit for storing communication parameters set up to acquire data of the application information from the file server;

a communication unit for transmitting request information for the test data to the file server by making use of the communication parameters, the transmission is executed in response to an executing instruction for the communication test;

a control unit for detecting a communication error generated within a period from the transmission of the request information to the reception of the test data; and

a display unit for displaying the detection result of the communication error.

the file server comprising:

a communication unit for receiving request information for the test data from the image processing apparatus and transmitting the test data, which corresponds to the image processing apparatus, to the image processing apparatus.

[CLAIM 7]

The data processing system set forth in claim 6, which is characterized in that:

a maintenance terminal enabling to transmit variable instruction information to the image processing apparatus is connected to a communication computer network, the maintenance terminal being provided with a communication unit for transmitting set-up operation information for the communication parameters, which is used in the image processing apparatus, to the image processing apparatus; and

the data storage unit of the image processing apparatus can store the communication parameters set up on the basis of the set-up operation information transmitted from the maintenance terminal.

[CLAIM 8]

The data processing system set forth in claim 7, which is characterized in that:

the communication unit of the maintenance terminal can transmit instruction information for executing the

communication test to the image processing apparatus; and the communication unit of the image processing apparatus can transmit the request information for the test data to the file server in response to the instruction information transmitted from the maintenance terminal.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[TECHNICAL FIELD TO WHICH THE INVENTION BELONGS]

The present invention relates to a facsimile machine, a printer, a copying machine, a MFP (Multifunction Peripheral), a printing machine, a terminal for providing printer information (e.g., a kiosk) or a combined machine of those (hereinafter, called as an image processing machine).

[0002]

[DESCRIPTION OF THE PRIOR ART]

Heretofore, in order to execute an update of various application information such as, an activation program for the image processing apparatus, a firmware which includes an application program used for processing an image, various function set-up data with respect to the image processing (for example, a paper size, density, other set-up data such as font), a person who is responsible for carrying out a maintenance of the image processing apparatus has to proceed to an actual locale, where the updating is to be executed, while carrying in his hand special tools and a personal notebook type computer in which application information for use in updating have been stored in a portable recording medium. Then, the updating of application information has been executed by transferring necessary data to the image processing apparatus connected to the personal notebook type computer through parallel cables (refer to, for example, the following Patent Document 1). As a result, a burden on the person in charge of maintenance with respect to an updating job is remarkably great.

[0003]

Therefore, in recent years, in consonance with the development of advanced computer network technology, many image processing apparatuses can be connected to a computer network, and in accordance with a predetermined rule, it becomes possible to transmit an instruction (command) through a firewall from the outer side to the image processing apparatuses. For this, there is an electronic mail as common means. For example, when application data such as a firmware for the image processing apparatus is attached to an electronic mail and, thereafter, the electronic mail is transmitted to image processing apparatuses, the updating of application data can also be executed at remote areas (Refer to, for example, the following Patent Document 2).

[0004]

In addition, it has been developed also such a remote

control technique as downloading data into a designated peripheral equipment through a computer network from another peripheral equipment in which operation executing data are stored (Refer to, for example, the following Patent Document 3). By applying this technique, when a file server, which stores therein data of application information for the updating, is equipped on the computer network, it becomes possible to download designated data of application information from the file server into the image processing apparatus.

[0005]

[Patent Document 1]

Japanese Patent Application Laid-open Publication No. 2000-322244

[Patent Document 2]

Japanese Patent Application Laid-open Publication No. 2000-296484

[Patent Document 3]

Japanese Patent Application Laid-open Publication No. Hei 11-3299

[0006]

[PROBLEMS TO BE SOLVED BY THE INVENTION]

As described above, in case that an electronic mail to which the data of application information are attached, if the application information is the firmware, there is a problem that it requires much time for communication, because a capacity of an attached file becomes too large.

[0007]

In addition, in the image processing apparatus, in case that the data of application information is acquired from the file server equipped on the computer network, it is necessary to set up various parameters such as, for example, a firewall equipped in a local computer network on the side of the image processing apparatus, an IP address of the file server, a communication protocol, etc. Therefore, if these communication parameters are erroneously set up, it is not possible to acquire the data of application information.

[0008]

Conventionally, in order to confirm that application information can be received positively, after set-up operation data such as the communication parameters and the ID have been designated, the image processing apparatus actually obtains the update data from the server. However, when the application data comprise a large quantity of program data, the time required to obtain the update data is extended, and after the data have been received, the performance of the automatic data updating process can not be avoided. Since the person in charge of maintenance must wait until the updating has been completed, the efficiency of the maintenance job is not satisfactory.

[0009]

In addition, even if a data size of application information is small, deterioration of the communication state may occur due to a change in the communication load, and an extended period of time may be required to obtain the data. However, since the person performing the maintenance will have no advance knowledge of how much time data acquisition will require, he or she can not employ an appropriate process, such as delaying the confirmation job for data acquisition and executing another job.

[0010]

It is a problem of the present invention to be able to confirm easily a matter whether a set-up operation of communication parameters for use in the image processing apparatus connected to a computer network is carried out correctly or erroneously and thereby to improve the efficiency of a maintenance job.

[0011]

[MEANS FOR SOLVING THE PROBLEM]

The invention described in claim 1 is an image processing apparatus connected to a file server having a database for storing data of application information for the image processing apparatus and test data used in a communication test, which is characterized by comprising:

- a data storage unit for storing communication parameters set up to acquire data of the application information from the file server;

- a communication unit for transmitting request information for the test data to the file server by making use of the communication parameters, the transmission is executed in response to an executing instruction for the communication test;

- a control unit for detecting a communication error generated within a period from the transmission of the request information to the reception of the test data; and

- a display unit for displaying the detection result of the communication error.

[0012]

According to the invention described in claim 1, since the request information for the test data is transmitted to the file server by making use of the communication parameters in response to the executing instruction for the communication test; then the communication error can be detected by executing the communication test for receiving the test data from the file server; and the detection result can be displayed, it makes possible to confirm easily correctness and error with respect to the set-up operation of the communication parameters for use in the image processing apparatus.

[0013]

The invention described in claim 2 is the image processing apparatus set forth in claim 1, which is characterized in that the control unit can detect the communication error in a manner of a plurality of divided stages with in the period from the transmission of the request information to the reception of the test data.

[0014]

The invention described in claim 3 is the image processing apparatus set forth in claim 2, which is characterized in that:

the control unit can detect the communication parameters used in a communication stage at which the communication error is detected; and

the display unit can display a notification information showing a matter that the detected communication parameters are erroneously set up.

[0015]

According to the invention described in claims 2 and 3, since the communication error can be detected by dividing a plurality of communication stages, then if the communication error is detected in a communication stage, the communication parameters used in the communication stage can be detected and notified, it becomes possible to correct easily the erroneously set up communication parameters.

[0016]

The invention described in claim 4 is the image processing apparatus set forth in claim 1, which is characterized in that:

the control unit can calculate a communication speed from a data size of the test data received by the communication unit and a time required for the reception of the test data; and

the display unit can display the calculated communication speed.

[0017]

According to the invention described in claim 4, since the communication speed at the time of communication test can be calculated and displayed, a person in charge of maintenance can hold of and understand a communication state, and thereby carry out the maintenance job in response to the communication state. Therefore, it makes possible to improve the efficiency of the maintenance job.

[0018]

The invention described in claim 5 is the image processing apparatus set forth in claim 4, which is characterized in that:

the control unit can calculate an assumption time required on the occasion of receiving data of the application information from the file server on the basis of the calculated communication speed; and

the display unit can display the calculated assumption time.

[0019]

According to the invention described in claim 5, the assumption time required for receiving the data of application information can be calculated and displayed, the person in charge of maintenance can hold of and understand easily an approximate time required for receiving the data of application information.

[0020]

The invention described in claim 6 is a data processing system in which an image processing apparatus connected to a file server having a database for storing data of application information for the image processing apparatus and test data used in a communication test, which is characterized in that:

the image processing apparatus comprising:

a data storage unit for storing communication parameters set up to acquire data of the application information from the file server;

a communication unit for transmitting request information for the test data to the file server by making use of the communication parameters, the transmission is executed in response to an executing instruction for the communication test;

a control unit for detecting a communication error generated within a period from the transmission of the request information to the reception of the test data; and

a display unit for displaying the detection result of the communication error.

the file server comprising:

a communication unit for receiving request information for the test data from the image processing apparatus and transmitting the test data, which corresponds to the image processing apparatus, to the image processing apparatus.

[0021]

According to the invention described in claim 6, since the request information for the test data is transmitted from the image processing apparatus to the file server by making use of the communication parameters in response to the executing instruction for the communication test; then the communication error can be detected by executing the communication test for receiving the test data from the file server; and the detection result can be displayed, it makes possible to confirm easily correctness and error with respect to the set-up operation of the communication parameters for use in the image processing apparatus.

[0022]

The invention described in claim 7 is the data processing system set forth in claim 6, which is characterized in that:

a maintenance terminal enabling to transmit variable instruction information to the image processing apparatus is connected to a communication computer network, the maintenance terminal being provided with a communication unit for transmitting set-up operation information for the communication parameters, which is used in the image processing apparatus, to the image processing apparatus; and

the data storage unit of the image processing apparatus can store the communication parameters set up on the basis of the set-up operation information transmitted from the maintenance terminal.

[0023]

According to the invention described in claim 7, since the set-up operation of the communication parameters for use in the image processing apparatus can be carried out from the side of the maintenance terminal through the communication computer network, a burden on the person in charge of maintenance to the set-up operation job can be reduced.

[0024]

The invention described in claim 8 is the data processing system set forth in claim 7, which is characterized in that:

the communication unit of the maintenance terminal can transmit instruction information for executing the communication test to the image processing apparatus; and

the communication unit of the image processing apparatus can transmit the request information for the test data to the file server in response to the instruction information transmitted from the maintenance terminal.

[0025]

According to the invention described in claim 8, since the execution of the communication test can be instructed from the side of the maintenance terminal to the image processing apparatus through the communication computer network, it becomes possible to improve the efficiency of the maintenance job.

[0026]

[EXEMPLIFIED MODE OF THE INVENTION]

Hereinafter, an exemplified mode of the present invention will be described in detail with reference to the accompanying drawings.

In a data processing system of the present exemplified mode, an image processing apparatus is connected to a file server. In this system, after communication parameters required for communication between the image processing apparatus and the file server are set up, a communication test can be executed to confirm correctness or error with respect to the set-up operation of the communication parameters.

[0027]

Firstly, a construction of the system is described.

In Fig. 1, a system construction of the data processing system 100 in the present exemplified mode is shown.

As shown in Fig. 1, the data processing system 100 comprises: maintenance terminals 1a and 1b; an image processing apparatus 2; and a server 3. The image processing apparatus 2, the maintenance terminal 1b and the server 3 are connected with one another through the computer network N so as to be able to access one another, while the image processing apparatus 2, the maintenance terminal 1a and the image processing apparatus 2 are connected with each other through an intranet L, which is a computer network deployed for a limited area.

[0028]

A computer network N includes various communication lines such as a telephone line network, an ISDN line network, a special line network, a mobile communication network, a satellite line network, a CATV line network, etc., and at least one base station of the Internet service provider through which these networks are connected. The computer network does not need to be connected always, but it is preferable to be able to connect by request optionally. In addition, it is desired for the computer network N to constitute such a network as holding security for allowing only specified users to make access thereto in view of reliability of information management.

[0029]

An intranet L is constructed by connecting the server and a plurality of clients with one another, and therefore it is a computer network deployed for a limit area within which information and resources are held in common between the server and the plurality of clients. It should be noted that, in the exemplified mode of the present invention, is described an example, in which a computer network is constructed by the image processing apparatus as a server and the maintenance terminal 3 as a client, is described. It should be further noted that, in the intranet L, it is desired for the computer network N to constitute such a network as holding security for allowing only specified users to make access thereto in view of reliability of information management.

[0030]

Subsequently, each of units or sections for constituting the data processing system 100 is described.

[0031]

Each of maintenance terminals 1a, 1b is a portable cellular phone set, a PHS (Personal Handyphone System), PDA (Personal Digital Assistant), a note type personal computer, etc. Each of the maintenance terminals 1a, 1b is provided with an electronic mail soft for transmitting and receiving

an electronic mail and a browser soft for reading a Web page, and can transmit instruction information for the maintenance of the image processing apparatus to the image processing apparatus 2 by making use the electronic mail or the browser.

[0032]

In the first place, the maintenance terminals 1a and 1b are now described. It should be noted that the constitution and operation of these terminals are specifically described with respect to the maintenance terminal 1a as a representative of them, because substantially the same arrangement is employed for the maintenance terminals 1a and 1b. Fig. 2 is a block diagram showing the constitution in a functional state of a maintenance terminal 1a. As shown in Fig. 2, the maintenance terminal 1a is constituted of a CPU as a control means, input unit 12, display unit 13, communication unit 14, RAM (Random Access Memory) 15, storage unit 16, all of which are connected one another through a bus 17.

[0033]

A control unit 11 is constructed such that a control means, for example, CPU (Central Processing Unit), etc, is included. The control unit 11 can open various system programs stored in the storage unit 16 and in addition a set-up operation program for the communication parameters (refer to Fig. 6) in the RAM 15, and totally control processing operation in corporation with the programs concerned.

[0034]

An input unit 12 includes character keys, numeric keys and various other types of keys, which are correlated with various functions, and outputs an operation signal that corresponds to a manipulated key to the control unit 11.

[0035]

A display unit 13 has a display screen such as an LCD (Liquid Crystal Display), etc., and can display inputted contents entered through the input unit 12 and various displayed screens on the basis of displaying information inputted from the controller 11.

[0036]

A communication unit 14 is constituted of various interfaces such as a computer network interface card, a modem, etc. The communication unit 14 can transmit set-up information for the communication parameters for use in the image processing apparatus 2 and instruction information for executing the communication test to the image processing apparatus 2.

[0037]

A RAM 15 forms a work area to temporarily store various programs to be executed by the controller 11 and data related to these programs.

[0038]

A storage unit 16 includes a recording medium, which is able to rewrite, such as a flash memory, etc., and stores a system program for the maintenance terminals 1a, 1b and in addition the set-up program for the communication parameters in the recording medium.

[0039]

In case that the maintenance terminal 1a is connected to the image processing apparatus 2 through the intranet L, the storage unit 16 can store application information for an updating to be transferred from the maintenance terminal 1a to the image processing apparatus 2 by making use of the ftp or http.

[0040]

Next, the image processing apparatus 2 will be described as follows.

The image processing apparatus 2, in which software for providing contents to be read at a WWW (World Wide Web) browser is installed, has both an image processing function and a function as a computer network server. In addition, the image processing apparatus is connected to a computer network N, which is an open communication computer network such as the Internet, etc., through a firewall FW.

[0041]

A structure of the image processing apparatus 2 is described with reference to Fig. 3.

As shown in Fig. 3, the image processing apparatus 2 comprises a control unit 21, an input unit 22, a display unit 23, a communication unit 24, a RAM 25, a data storage unit 26, a printing unit 27 and a storage unit 28, all of which are interconnected through a bus 29.

[0042]

The control unit 21 comprises a control means such as a CPU, etc. The control unit opens a system program for the image processing apparatus 2 and, in addition, a test operation program (refer to Fig. 8) concerning the present invention, which are stored in the storage unit 28, at the RAM 25, and totally control processing operations in corporation with the programs concerned.

[0043]

The input unit 22 includes a touch panel integrally connected to an display unit 23, numeric input keys and various function keys, and can output operation signals to the control unit 21.

[0044]

The display unit 23 has a display screen such as an LCD, etc., and can display various display screens such as an operation display screen, a set-up display screen for the communication parameter, a test result display screen for the communication test.

[0045]

The communication unit 24 is an interface connectable to a transmission medium, which is connected to a computer network N such as a LAN, WAN, or the Internet, etc. The communication unit 24 is constituted of a modem or a terminal adaptor (TA), etc., and can perform to control communication with external equipments through a communication line such as, for example, a telephone line, an ISDN line, a wireless communication line, a special line or a CATV line, etc.

[0046]

The RAM 25 can form a work area for temporarily storing various programs to be executed by the control unit 21 and data subjected to processing by these programs.

[0047]

The data storage unit 26 comprises an EEPROM (Electrically Erasable and Programmable Read-Only Memory), and can store data that are less frequently rewritten such as, for example, data of application information used in the image processing apparatus 2, identification information for identifying an individual image processing apparatus 2 (e.g., a serial number, a product name, a model type, a version of the model type). In addition, the data storage unit 26 can store various communication parameters required on the occasion of acquiring data of application information used for updating data from the server 3 is stored.

[0048]

The printing unit 27 includes a scanner, a sheet supply unit for supplying printing sheets, etc. The printing unit 27 can execute a print on a designated printing sheet on the basis of image data inputted from the control unit 21. It should be noted that a printing method is not limited, either an ink jet method or an electro-photography method can be employed.

[0049]

The storage unit 28 is provided with a recording medium comprising a magnetic or optical recording medium or a semiconductor memory. A system program for the image processing apparatus and, in addition to this, program for the test operation are stored on this recording medium.

[0050]

Next, the file server 3 will be described.

The file server 3 includes a database, which can store data of application information corresponding to a model type of the image processing apparatus by making use of a hierarchical directory structure. The file server 3 can provide the data of application information to the image processing apparatus 2 through the computer network N in response to a request from the image processing apparatus 2.

[0051]

With reference to Fig. 4, a structure of the file server 3 is now described as follows. As is shown in Fig. 4, the

server 3 comprises: a control unit 31, a RAM 32, a communication unit 33 and a database (hereinafter, described as DB) 34.

[0052]

The control unit 31 comprises a control means such as a CPU, etc. In response to a requesting instruction received from the image processing apparatus 2 through the communication unit 33, the CPU 31 as a control means allows itself to acquire designated data from the DB 34 and transmit the data to the requesting source.

[0053]

The RAM 32 forms therein a work area. By this, a requesting instruction received through the communication unit 33 and data acquired from the DB 34 are temporarily stored in the work area.

[0054]

The communication unit 33 includes a computer network interface card and a modem. The communication unit 33 can receive the requesting information of the test data for the communication test issued from the image processing apparatus, and transmit the test data inputted by the control unit 31 to the image processing apparatus 2.

[0055]

The DB 34 is used to store application data for use in the image processing apparatus 2 by making use of a hierarchical directory structure.

[0056]

An example of data storage in the DB 34 is shown in Fig. 5.

As is shown in Fig. 5, in the DB 34, a plurality of directories are prepared. The data of application information are stored in each of the classed directories.

[0057]

In the most upper directory, a directory classed in every model type of the image processing apparatus is stored. The directory name is, for example, "7155", "7165" or "7085" assigned under a model type.

[0058]

Under the directories prepared under model types, other directories for storing the data of application information corresponding to every model type are stored. For example, as these directories, there are a directory, "Newest" or "ver40", etc., named as a version name of application information and a directory, "custom" in which a special firmware in accordance with the user's usage and various set-up data.

[0059]

Under these directories for storing the application information, data file for application information such as "I0.bin", "I1.bin", etc., are stored in every type. Further,

a file, "test dat" for the test data for use in the communication test is also stored thereat.

[0060]

Next, an operation of the present exemplified mode will now be described hereinafter.

[0061]

In the first place, a set-up processing of the communication parameters executed by the maintenance terminal 1a is described while making reference to a flowchart shown in Fig. 6. This set-up processing of the communication parameters is a processing such that various communication parameters required for communication between the image processing apparatus 2 and the file server 3 on the occasion of allowing the image processing apparatus to acquire the application information for use in the updating can be set up.

[0062]

In the present exemplified mode, such an example of the set-up processing of the communication parameters as executing the set-up processing by the operation of the person in charge of maintenance through the maintenance terminal 1a is described. However, the set-up processing may be executed through the maintenance terminal 1b. Moreover, the set-up processing may be executed directly through the input unit 22 of the image processing apparatus 2.

[0063]

In the set-up processing shown in Fig. 6, when an instruction for activating the browser is inputted through the input unit 12 of the maintenance terminal 1a, the browser can be activated, and an environment set-up display screen for the image processing apparatus 2 can be displayed. Subsequently, when an instruction for setting up the communication parameters is inputted from the input unit 12, request information for the set-up can be prepared, and the request information can be transmitted to the image processing apparatus 2 through the communication unit 24 (step S1).

[0064]

When the request information has been transmitted, program control is shifted to a process in step S2. In the step S2, a state whether the access can be permitted by the image processing apparatus 2 is distinguished. In case that the access is not permitted (NO at step S2), an error display screen is displayed on the display unit 13, and the set-up processing is thereafter terminated. In case that the access is permitted by the image processing apparatus 2 (YES at step S2), program control is shifted to a process in step S3. In the step S3, a selection display screen for selecting a type of data acquisition method to acquire the data of application information for use in the image processing apparatus 2 can be displayed on the display unit 13.

[0065]

With respect to the data acquisition method, there has been prepared the following three types different from one another in a protocol used for transferring data, that is, an acquisition method by making use of ftp (file transfer protocol), an acquisition method by making use of http (hypertext transfer protocol), and an acquisition method by making use of an electronic mail. In the ftp or http acquisition method, a protocol, ftp or http is used on the occasion of acquiring the data of application information for use in the updating executed in the image processing apparatus 2. In the electronic mail acquisition method, the data of application information can be acquired from the file server 3 by transmitting an electronic mail for instructing the image processing apparatus to transmit the data of application information for use in the updating.

[0066]

As the data acquisition method, in case that the ftp acquisition method is selected through the input unit 12 (ftp at step S3), instruction information for setting up ftp is transmitted from the communication unit 14 of the maintenance terminal 1a to the image processing apparatus 2 (step S41). Then, when set-up information for the communication parameters of ftp issued from the image processing apparatus is received by the maintenance terminal 1a, program control is shifted to a process in step S5. In the step S5, a set-up display screen 131 (refer to figure (a) in Fig. 7) can be displayed on the display unit 13.

[0067]

In the set-up display screen 131 for ftp shown in a figure (a) in Fig. 7, the following four head boxes for communication parameters can be displayed therein, that is: a head box for inputting an address to access the file server 3; a head box for inputting a connection port of the file server 3; a head box for inputting a user's ID and a password to execute a log-in authentication to the file server 3; and a head box for inputting a firewall IP address to access an outer computer network passing through a fire wall FW.

[0068]

As the data acquisition method, in case that the http acquisition method is selected through the input unit 12 (http at step S3), instruction information for setting up http is transmitted from the communication unit 14 of the maintenance terminal 1a to the image processing apparatus 2 (step S42). Then, when set-up information for the communication parameters of http issued from the image processing apparatus is received by the maintenance terminal 1a, program control is shifted to a process in step S5. In the step S5, a set-up display screen 132 (refer to figure (b) in Fig. 7) can be displayed on the display unit 13.

[0069]

In the set-up display screen 132 for http shown in a figure (a) in Fig. 7, as same as shown in the figure (a) in Fig. 7, the following four head boxes for communication parameters can be displayed therein, that is: a head box for inputting an address to access the file server 3; a head box for inputting a connection port of the file server 3; a head box for inputting a user's ID and a password to execute a log-in authentication to the file server 3; and a head box for inputting a firewall IP address to access an outer computer network passing through a fire wall FW.

[0070]

As the data acquisition method, in case that the electronic mail is selected through the input unit 12 (mail at step S3), instruction information for setting up the electronic mail is transmitted from the communication unit 14 of the maintenance terminal 1a to the image processing apparatus 2 (step S43). Then, when set-up information for the communication parameters of http issued from the image processing apparatus is received by the maintenance terminal 1a, program control is shifted to a process in step S5. In the step S5, a set-up display screen 133 (refer to figure (c) in Fig. 7) can be displayed on the display unit 13.

[0071]

In a set-up display screen 133 for the electronic mail shown in a figure (c) in Fig. 7, the following three head boxes for communication parameters can be displayed therein, that is: a head box for inputting an electronic mail server address; a head box for inputting a user's ID and a password of the electronic mail server; and a head box for inputting an electronic mail address of the image processing apparatus 2.

[0072]

In the above-described set-up display screens, the person in charge of maintenance can input various communication parameters, which are required for acquiring the data of application information, while making those to correspond to the head boxes, respectively.

[0073]

When various communication parameters, the user's ID and the password has been inputted through the input unit 12 in each of the displayed set-up display screens (step S7), and then an instruction for an input completion is inputted, the inputted various communication parameters, user's ID and the password are transmitted from the maintenance terminal 1a to the image processing apparatus 2 (step 8).

[0074]

In the image processing apparatus 2, a user's authentication is executed with the user's ID and the password transmitted from the maintenance terminal 1a. In

case that the use's authentication has been not successful, an error notification information is transmitted to the maintenance terminal 1a. On the other hand, the user's authentication has been successful, the set-up of the various communication parameters transmitted from the maintenance terminal 1a to the image processing apparatus 2. In case that the set-up processing has been terminated normally, a completion notifying information thereof is transmitted from the image processing apparatus 2 to the maintenance terminal 1a. On the contrary, in case that an error has been generated in the set-up processing, an error notifying information thereof is transmitted from the image processing apparatus 2 to the maintenance terminal 1a.

[0075]

At the maintenance terminal 1a, it can be distinguished whether a notification information for the completion of the set-up operation of the communication parameters issued from the image processing apparatus is received or not (step S9). In case that the notification information for the completion of the set-up operation is not received, and instead that error notification information is received (NO at step S9), the program control is returned to the process in step S3 in which the set-up operation of the communication parameters is carried out again. On the other hand, in case that the notification information for the completion of the set-up operation is received (YES at step S9), the set-up operation of the communication parameters is ended.

[0076]

Next, with reference to Fig. 8, a test processing executed by the image processing apparatus 2 will be described. In the test processing, before data for use in updating are obtained from the server 3, whether the communication parameters have been correctly designated for the image processing apparatus 2 is distinguished. In addition, in the test processing, the communication test is executed in response to an instruction for the communication test by making use of the communication parameters set up at the set-up operation of the communication parameters, and whether an error is generated or not through the communication process.

[0077]

In the present exemplified mode, it is described about an example that the test processing is begun in response to the instruction information for executing the communication test transmitted from the maintenance terminal 1a by the manipulation of the person in charge of maintenance, and that the test result is displayed on the display unit 13 of the maintenance terminal 1a. However, the instruction for conducting the communication test and the test result may be issued from the maintenance terminal 1b, or by using the

operating unit 22 and the display unit 23 of the image processing apparatus 2.

[0078]

In the test processing shown in Fig. 8, first, a check is carried out to distinguish a state whether the instructing information to conduct the communication test is received from the maintenance terminal 1a through the communication unit 24 (step S101). Hereinafter, the description is as letting the instruction information being received from the maintenance terminal 1a.

[0079]

In case that the instructing information for the communication test is received (YES at step S101), request information is generated to request the test data for the communication test. The request information includes the information of a URL that represents the storage location of the text data. Then, a check is carried out to distinguish which acquisition method out of the ftp, the http and the electronic mail is set up (step S102).

[0080]

In case that an acquisition method by the ftp is set up (ftp at step S102), communication parameters, which are designated for the ftp acquisition method, are read out (step S103). Then, program control is shifted to the process in step S106.

[0081]

In case of an acquisition method by the http is designated (http at step 102), communication parameters, which are designated for the http acquisition method, are read out (step S104). Program control is then shifted to the process in step S106.

[0082]

In case that an acquisition method by the electronic mail is designated (the electronic mail at step S102), communication parameters, which are designated for the electronic mail acquisition method, are read out (step S105), and program control is shifted to the process in step S106.

[0083]

At step S106, the obtained communication parameter is employed to attempt the connection to the firewall FW through the communication unit 24, and a check is carried out to distinguish a state whether the connection to the firewall FW is established. That is, a communication error is detected in the process of the connection to the firewall FW. When the connection to the firewall FW fails (ERROR at step E3), it is assumed that the set-up operation information for the firewall FW, such as the address of the firewall FW and the connection port, is incorrect. Then, a communication error message is displayed on the display unit 23 to notify the communication test results that the connection to the

firewall FW is not established, and a response error code is also displayed, indicating that the connection error has occurred in the process of the connection to the firewall FW (step S107).

[0084]

On the other hand, in case that the connection to the firewall FW is established (OK at step S106), program control is shifted to the process in step S108. In step S108, the connection to the server 3 is attempted, and whether the connection to the server 3 is established is distinguished. That is, a communication error is detected in the process of the connection to the server 3. In case that the connection to the server 3 is not established (ERROR at step S108), it is assumed that the set-up operation information for the server 3, such as the address of the server 3, the connection port, the user name and the password, etc., is incorrect. Then, a communication error message is displayed on the display unit 23 to notify that the connection to the server 3 is not established (step S109).

[0085]

In case that the connection conducted to the server 3 is established (OK at step S108), the request information for the test data is transmitted through the communication unit 24 to the server 3. Control program is shifted to the process in step S110.

[0086]

In the file server 3, upon receipt of the request information for the test data from the image processing apparatus 2, information of a model type and its version of image processing apparatus is read out from the request information, and further the test data, which corresponds to the information of the model type and its version, is read out from the DB 34. Then, the read out test data is transmitted to the image processing apparatus 2.

[0087]

In step S110, whether the test data issued from the file server through the communication unit 24 can be received or not is designated. That is, a communication error is detected in the communication stage. In case that the test data cannot be normally received (ERROR at step S110), it is assumed that a transmission error has occurred to the incorrect set-up operation of the communication parameters on the side of the server 3. Then, a reception error message, indicating that the test data cannot be received, is displayed on the display unit 23 (step S111).

[0088]

In case that the test data can be normally received from the server 3 (OK at step S110), program control is shifted to step S112. In step S112, the period of time (hereinafter referred to as a reception period) required until the test

data were received and the size of the test data are employed to calculate the communication speed using the following equation (1):

$$\text{Communication speed (bps)} = \frac{\text{test data size (bit)}}{\text{reception period (sec)}} \dots (1)$$

[0089]

To present a period of time for receiving data of application information from the server 3 at the current communication speed as an example, on the basis of the calculated communication speed, an estimate period required for the data reception is calculated for each different data size. For example, the estimate period of time when the data size of application data is 1 M byte, or the estimate period of time for 5 M bytes, or the estimate period of time for 10 M bytes is calculated.

[0090]

It should now be noted that, in case of the size of the data for use in updating to be obtained from the server 3 is known in advance, the estimate period of time corresponding to the data size may be calculated. Therefore, the information consonant with the actual state can be provided for the person in charge of maintenance.

[0091]

Subsequently, at step S113, a test result display screen 231 (refer to Fig. 9) is displayed on the display unit 23 to notify that a communication error is not detected and the test data have been normally received, i.e., that the correct communication parameter has been set up. On the test result display screen 231, the communication speed and the estimate period of time required for the reception of data for use in updating, which are obtained at step S112, are displayed on the list with the test results.

[0092]

It should be noted that the test result display screen 231 may be displayed on the display unit 13 of the maintenance terminal 1a. In this case, the information displayed on the test result display screen 231 can be transmitted from the image processing apparatus 2 to the maintenance terminal 1a, and can be displayed on the display unit 13 of the maintenance terminal 1a.

[0093]

As is described above, after the set-up operation information, such as the communication parameter, that the image processing apparatus 2 requires to obtain the data for use in updating from the server 3 is designated to the image processing apparatus 2, the image processing apparatus 2 performs the communication test and obtains test data from the server 3. Thus, whether the set-up operation information necessary for obtaining the data for use in updating is correctly set up can be easily distinguished, and the job

efficiency for the maintenance person can be improved.

[0094]

Further, in case that a communication error has occurred as the results of the communication test, an error is displayed at a communication step whereat a communication error has occurred, and which step whereat the communication error has occurred is represented by using a response error code. Therefore, the maintenance person can easily correct the set-up operation information.

[0095]

Further, since test data in a small data size is employed for the communication test, the period required for the reception of the test data can be reduced. Therefore, the communication test can be conducted for a short period of time, and the load imposed on the maintenance person can be more reduced.

[0096]

Further, since the communication speed can be calculated based the test data reception results, and can be displayed together with the results of the communication test, the maintenance person can understand the current communication state. To obtain the data for use in updating from the server 3, the maintenance person can distinguish the communication state based on the communication speed on the display, and can take various countermeasures, such as putting off the acquisition of data for use in updating from the server 3 when the traffic is heavy. As a result, the maintenance job efficiency can be increased.

[0097]

Still further, on the basis of the communication speed obtained through the calculation, the estimate period of time required for the data reception is calculated for each different data size, and is displayed. Therefore, the maintenance person can easily understand the approximate period of time required for the data reception.

[0098]

It should be noted that the present exemplified mode is merely an example for the image processing apparatus, the maintenance terminals, the server and the data processing system according to the present invention. However, the detailed configuration and the detailed operation are not limited to those for the third embodiment, and can be modified as needed without departing from the subject of the present invention.

[0099]

[EFFECTS OF THE INVENTION]

According to the invention described in claim 1, since the request information for the test data is transmitted to the file server by making use of the communication parameters in response to the executing instruction for the

communication test; then the communication error can be detected by executing the communication test for receiving the test data from the file server; and the detection result can be displayed, it makes possible to confirm easily correctness and error with respect to the set-up operation of the communication parameters for use in the image processing apparatus.

[0100]

According to the invention described in claims 2 and 3, since the communication error can be detected by dividing a plurality of communication stages, then if the communication error is detected in a communication stage, the communication parameters used in the communication stage can be detected and notified, it becomes possible to correct easily the erroneously set up communication parameters.

[0101]

According to the invention described in claim 4, since the communication speed at the time of communication test can be calculated and displayed, a person in charge of maintenance can hold of and understand a communication state, and thereby carry out the maintenance job in response to the communication state. Therefore, it makes possible to improve the efficiency of the maintenance job.

[0102]

According to the invention described in claim 5, the assumption time required for receiving the data of application information can be calculated and displayed, the person in charge of maintenance can hold of and understand easily an approximate time required for receiving the data of application information.

[0103]

According to the invention described in claim 6, since the request information for the test data is transmitted from the image processing apparatus to the file server by making use of the communication parameters in response to the executing instruction for the communication test; then the communication error can be detected by executing the communication test for receiving the test data from the file server; and the detection result can be displayed, it makes possible to confirm easily correctness and error with respect to the set-up operation of the communication parameters for use in the image processing apparatus.

[0104]

According to the invention described in claim 7, since the set-up operation of the communication parameters for use in the image processing apparatus can be carried out from the side of the maintenance terminal through the communication computer network, a burden on the person in charge of maintenance to the set-up operation job can be reduced.

[0105]

According to the invention described in claim 8, since the execution of the communication test can be instructed from the side of the maintenance terminal to the image processing apparatus through the communication computer network, it becomes possible to improve the efficiency of the maintenance job.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[FIG. 1]

This figure is a schematic whole view showing a system construction of the data processing system according to an exemplified mode to which the present invention is applied.

[FIG. 2]

This figure is a block diagram showing a functional construction of a maintenance terminal 1a shown in Fig. 1.

[FIG. 3]

This figure is a block diagram showing a functional construction of an image processing apparatus 2 shown in Fig. 1.

[FIG. 4]

This figure is a view showing a functional construction of a file server 3 shown in Fig. 1.

[FIG. 5]

This figure is a block diagram showing a directory construction of DB 34 shown in Fig. 4.

[FIG. 6]

This figure is a flowchart, which explains a set-up operation of communication parameters executed by the maintenance terminal 1a.

[FIG. 7]

These figures are views, each showing a set-up operation display screen of the communication parameters displayed in the set-up operation of the communication parameters in which the figure (a) is a view showing a set-up operation display screen 131 in case of using ftp, the figure (b) is a view showing a set-up operation display screen 132 in case of using http, and the figure (c) is a view showing a set-up operation display screen 133 in case of using an electronic mail.

[FIG. 8]

This figure is a flowchart, which explains a test processing executed by the image processing apparatus.

[FIG. 9]

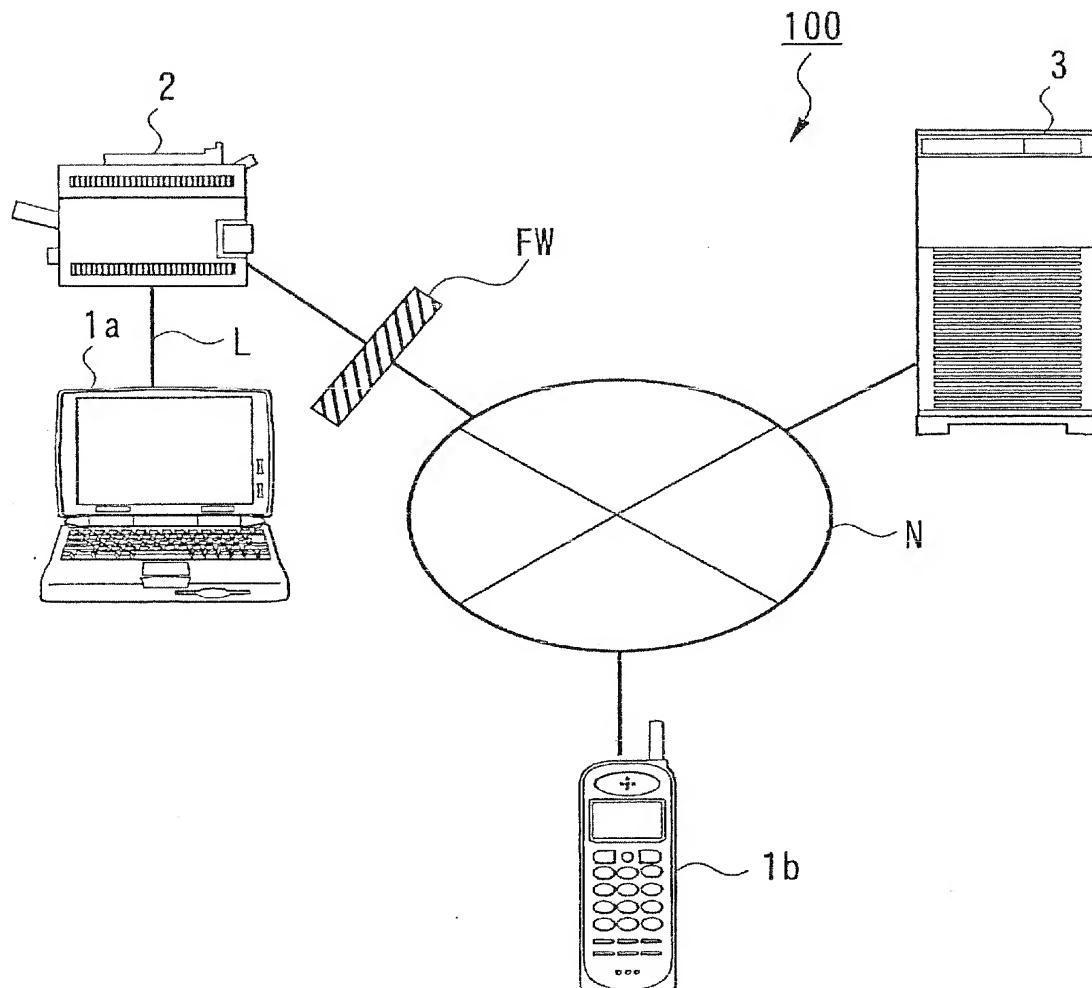
This invention is a view showing a test result display screen 231 displayed in the test processing.

[DESCRIPTION OF REFERENCE NUMERALS]

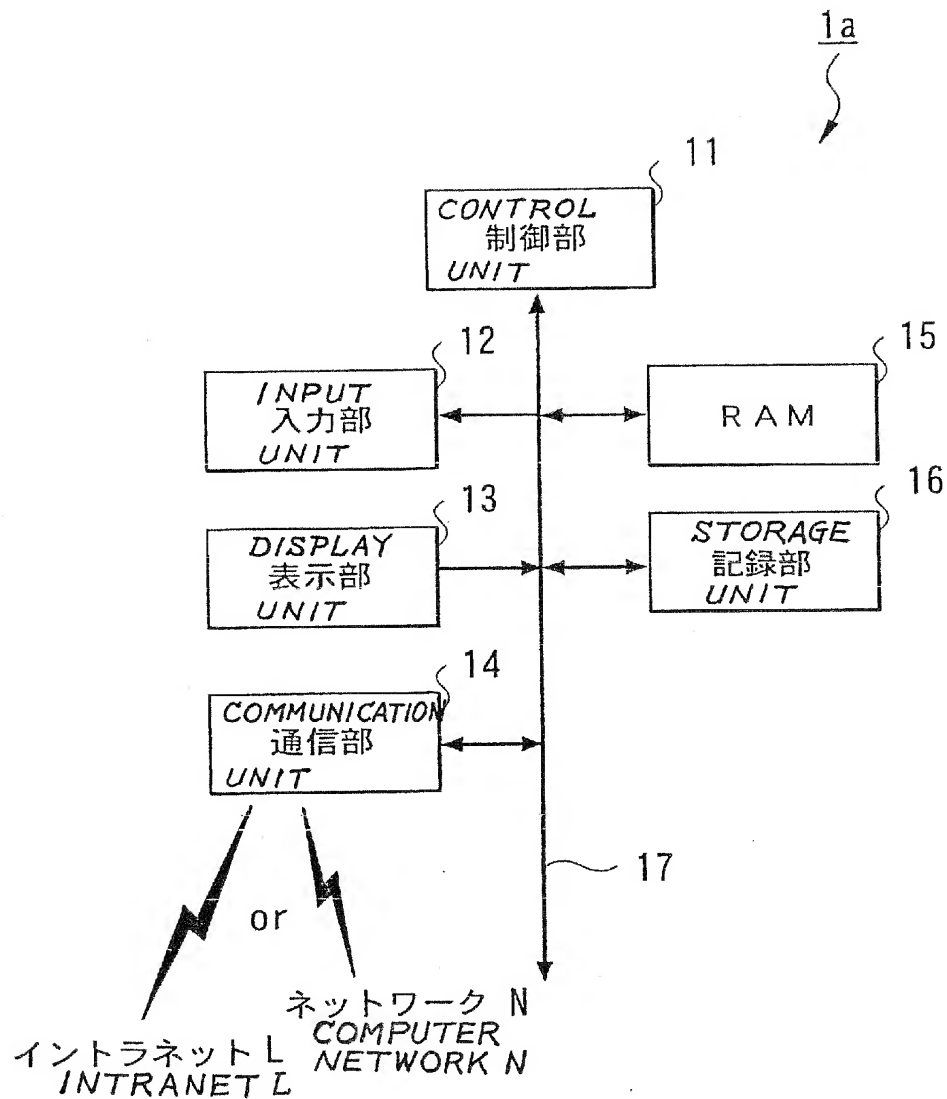
- 1a, 1b Maintenance terminal
- 11 Control unit
- 12 Input unit
- 13 Display unit
- 14 Communication unit

15 RAM
16 Storage unit
2 Image processing apparatus
21 Control unit
22 Input unit
23 Display unit
24 Communication unit
25 RAM
26 Data storage unit
27 Printing unit
28 Storage unit
3 File server
31 Control unit
32 RAM
33 Communication unit
34 DB

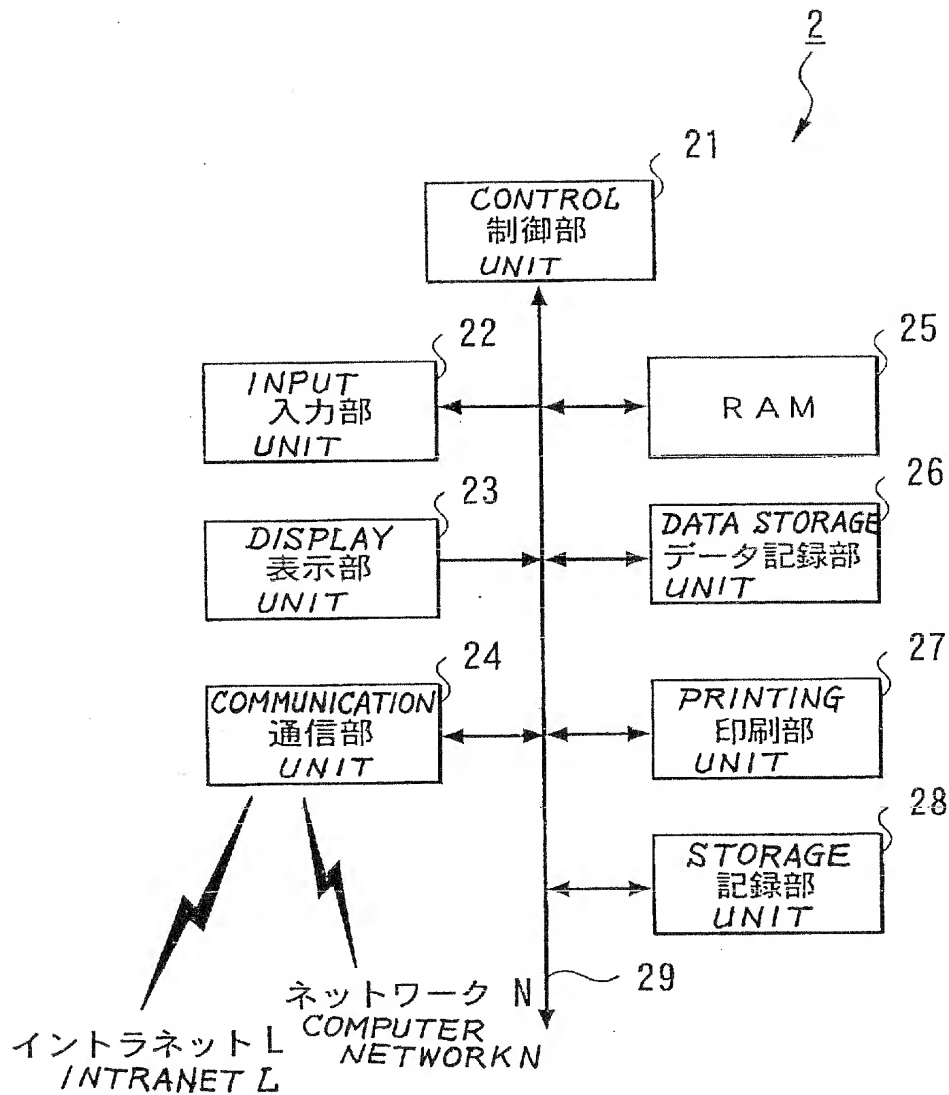
[NAME OF DOCUMENT] DRAWINGS
[FIG. 1]



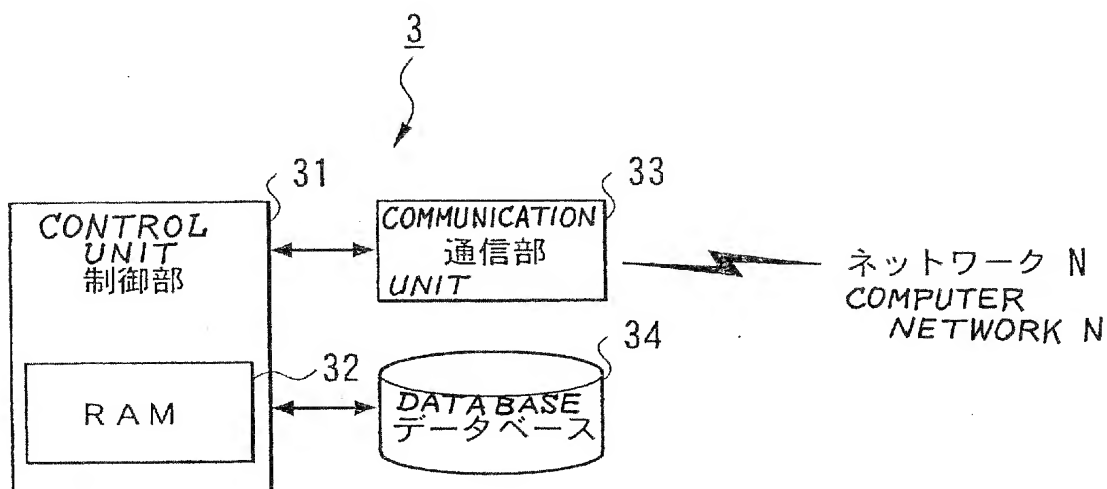
[FIG. 2]



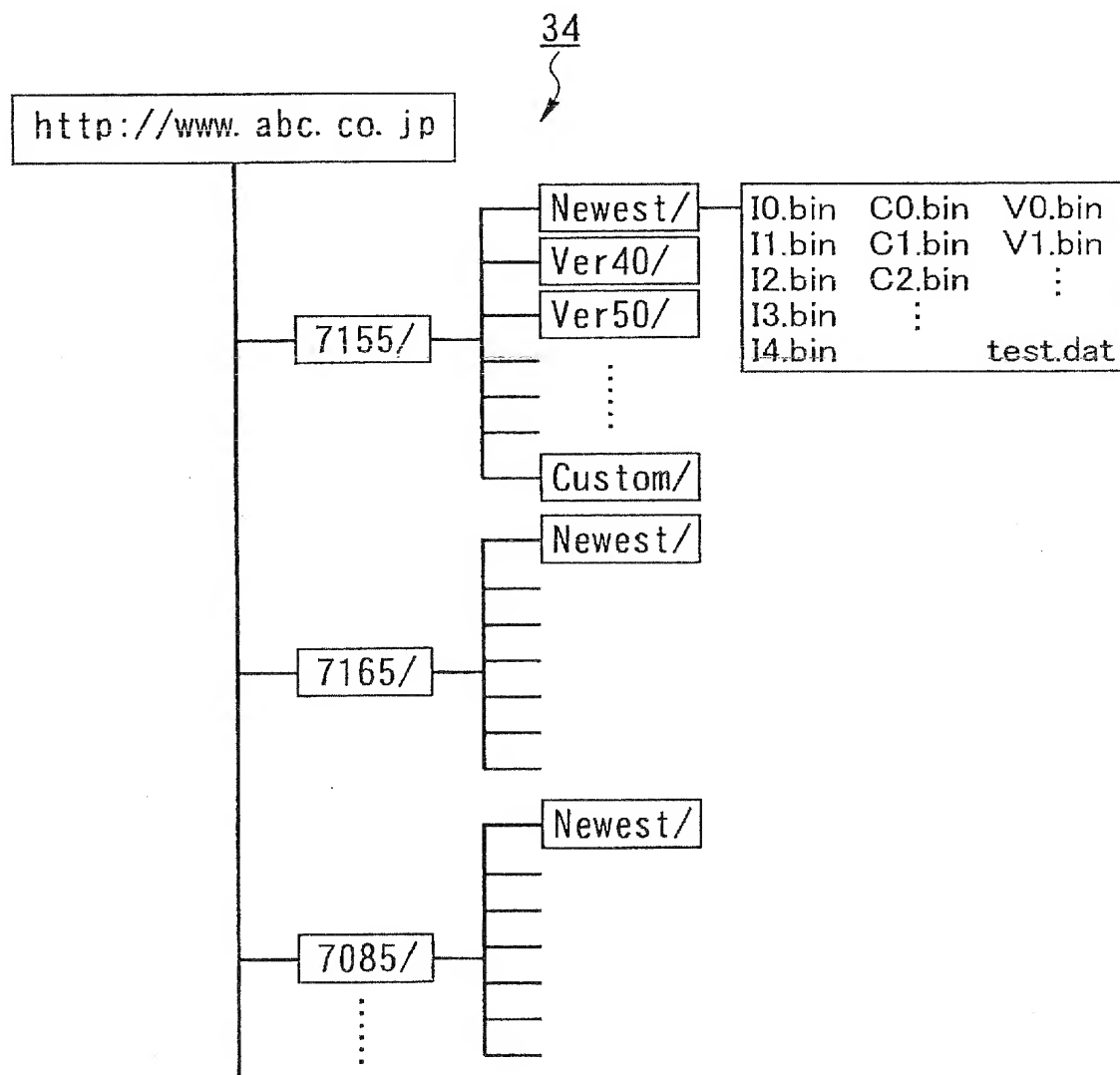
[FIG. 3]



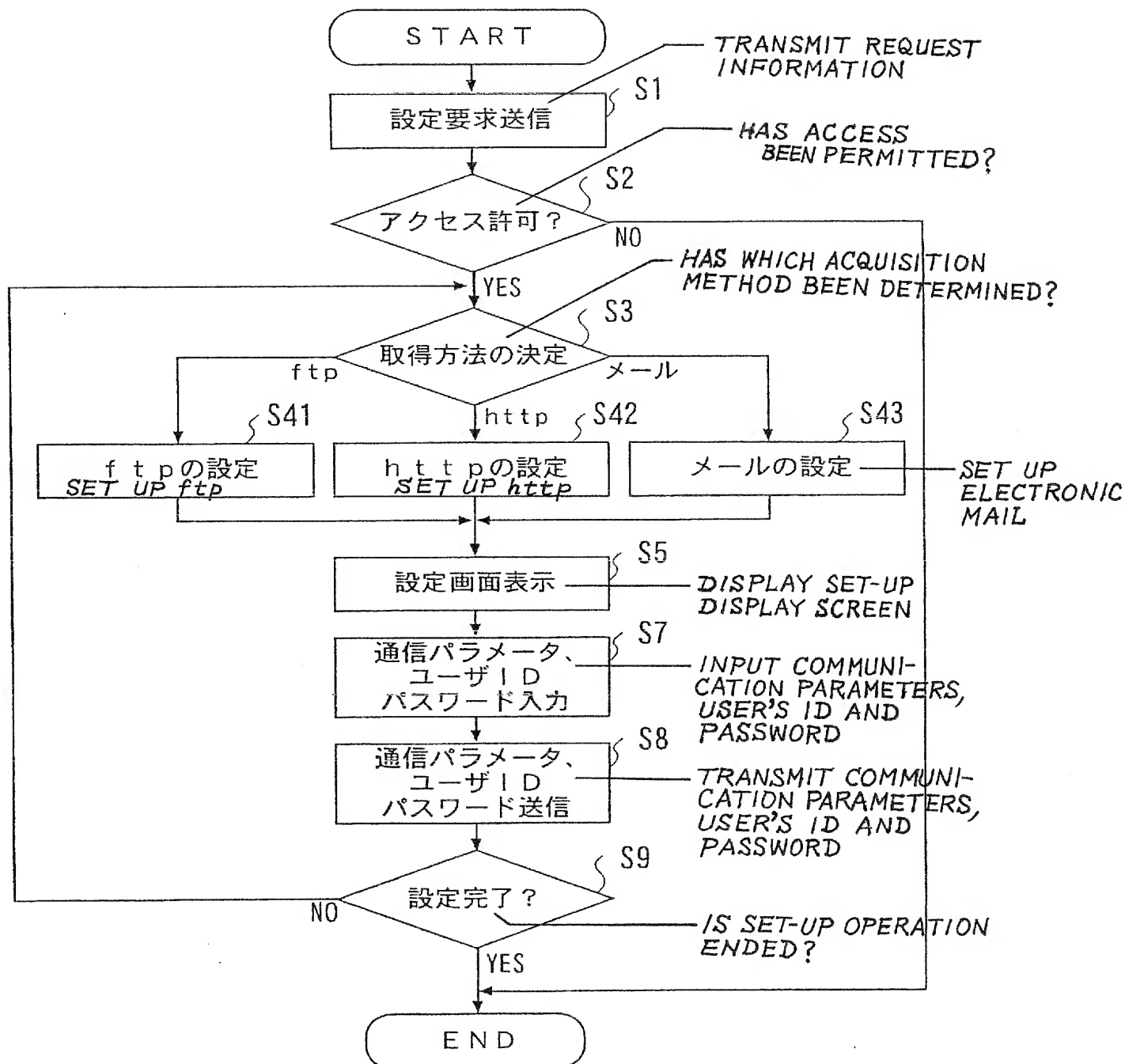
[FIG. 4]



[FIG. 5]



[FIG. 6]



[FIG. 7]

(a) 131

1. PROGRAM SERVER SETUP (FTP)

☒ USE ftp

PROGRAM SERVER ADDRESS

ftp: //abc. co. jp/com/version3/

USER ID abc PASSWORD *****

2. FIREWALL SETUP

☒ USE HTTP proxy ☐ USE FTP proxy

FIREWALL IP ADDRESS 10 . 0 . 16 . 206

PORT 8080

(b) 132

2. PROGRAM SERVER SETUP (HTTP)

☒ USE http

PROGRAM SERVER ADDRESS

http: //abc. co. jp/com/version3/ a1

USER ID abc PASSWORD *****

2. FIREWALL SETUP

☒ USE HTTP proxy ☐ USE FTP proxy

FIREWALL IP ADDRESS 10 . 0 . 16 . 206

PORT 8080

(c) 133

3. PROGRAM SERVER SETUP (EMAIL)

☒ USE POP3 ☐ USE IMAP

RECEIVED EMAIL SERVER ADDRESS

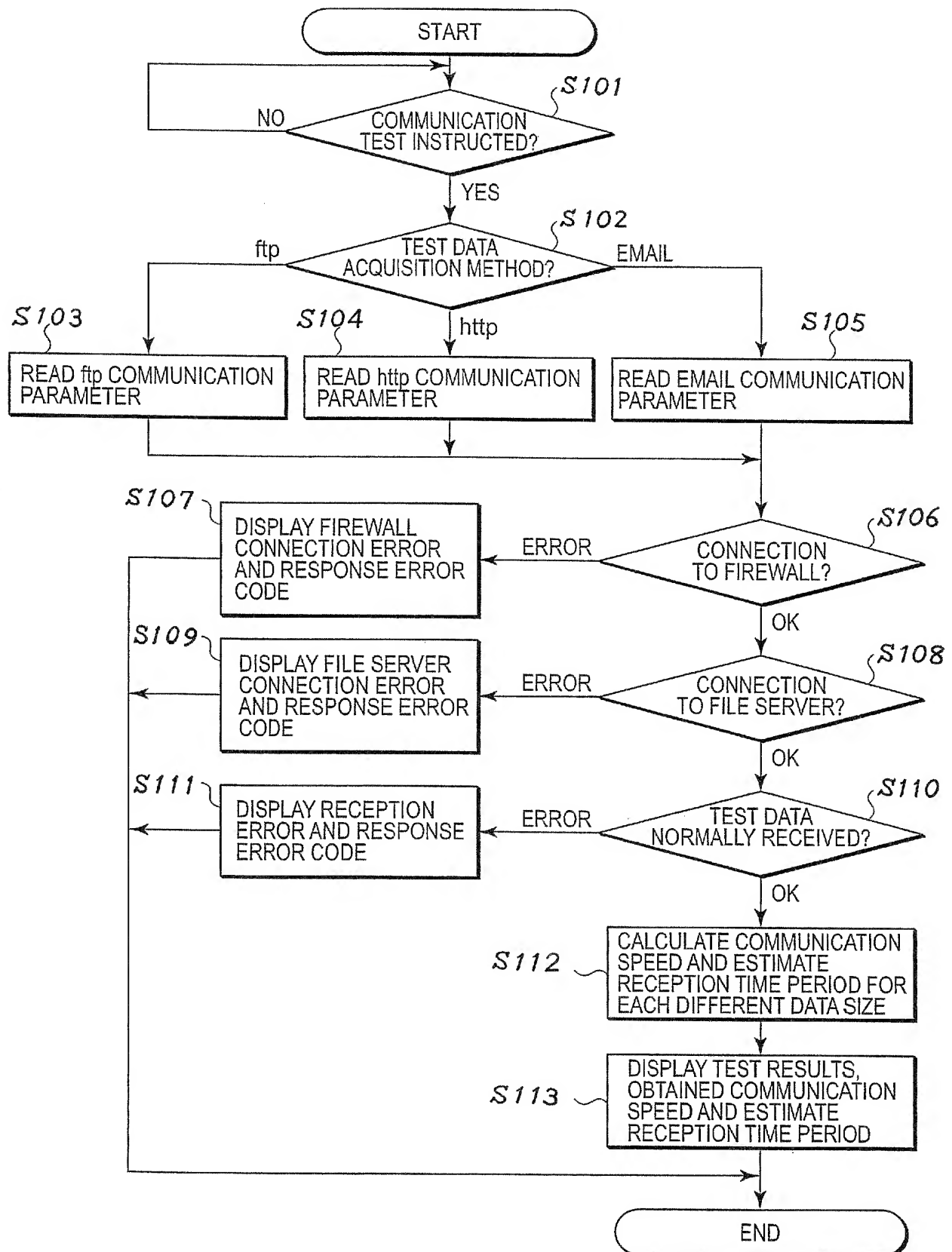
mailserver. office. co. jp

USER ID abc PASSWORD *****

EMAIL ADDRESS

abc@mailserver. office. co. jp

[FIG. 8]



[FIG. 9]

231**TEST RESULTS**

ANY COMMUNICATION ERROR IS NOT DETECTED,
AND TEST DATA ARE NORMALLY RECEIVED.

CURRENT COMMUNICATION SPEED IS 100 Kbps.
ESTIMATE TIME PERIODS FOR DATA RECEPTION AT
THIS COMMUNICATION SPEED ARE AS FOLLOWS.

<u>DATA SIZE</u>	<u>ESTIMATE TIME</u>
1 M byte	1 min. 20 sec.
5 M bytes	6 min. 40 sec.
10 M bytes	13 min. 20 sec.

[NAME OF DOCUMENT] BRIEF

[ABSTRACT]

[PROBLEM] To aim for easily determining whether set up data required for communication parameters with respect to an image processing apparatus connected to a network are designated correctly, and thereby improving the efficiency of a maintenance job.

[SOLVING MEANS] In a data processing system 100, an image processing apparatus 2 and a file server 3 are connected with each other through a network. After communication parameters required for making communication between the image processing apparatus 2 and the file server 3 are set up in the image forming apparatus 2, a communication test is executed for confirming whether set up data are designated correctly or erroneously. In the communication test, request information of test data is transmitted from the image processing apparatus 2 to the file server 3 by making used of the set up communication parameters, and the test data is transmitted from the file server 3 to the image processing apparatus 2. At the time of this communication, a communication error is detected in the image processing apparatus 2.

[DRAWINGS TO BE SELECTED] Fig. 1